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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/741,434	12/21/2000	Takashi Fukuda	2000_1743A	5280

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EXAMINER

ANGEBRANNDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 01/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application N .

Applicant(s)

09/741,434

FUKUDA ET AL.

Examiner

Art Unit

Martin J Angebrannt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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1. The response provided by the applicant has been read and given careful consideration. Rejections of the previous office action not appearing below are withdrawn based upon the amendments and arguments of the applicant. Responses to the arguments offered by the applicant are presented after the first rejection to which they are directed.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over either of Brooks '012 or Champagne '381, combined with Natansohn et al. '381.

Brooks '012 teaches the formation of microholograms, which are magnified images of the object recorded. In figures 1, the laser beams is split into the reference (14) and object beams (15). The holographic recording medium (20) in figure 1 records the overlap of the focused object beam with a portion of the reference beam. Clearly, the area covered by the object beam is a subset of that covered by the reference beam. The recording of plural images in the medium and the need to move the medium is disclosed. (3/1-8). The use of photochromic materials as the holographic recording material is disclosed. (2/13-16). The beam is assumed to be split equally into the reference and object beams which intersect at an angle..

Champagne '381 teaches the use of double exposure holograms in defect or stress analysis. The area of the recording medium (64 or 92 in figures 1 and 3) exposed to the object beam (52, 82 & 88) is less than that illuminated by the reference beams (68 and

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96). The formation of holograms in sequential areas is disclosed along with the need for development. (2/64-68). The focusing of the light from the specularly reflective object allows a shortening of the exposure times due to more efficient light collection. (2/8-43). The beam is assumed to be split equally into the object and reference beams which intersect at an angle.

Natansohn et al. '381 teaches polyesters, polystyrene, polyacrylates, polyurethanes, polyamides and polymethylmethacrylates with photochromic azobenzene moieties incorporated therein. (4/48-5/68). The recording of gratings or holograms is disclosed. (8/3-6 and 8/36-37). These are disclosed as erasable. (8/14+). The examiner holds that the MW is between 1,000 and 1,000,000 based upon the Tg and that it is likely near to 1,000,000.

It would have been obvious to one skilled in the art to modify the process used by either of Brooks '012 or Champagne '381 with respect to the cited figures by using the azobenzene containing polymeric materials of Natansohn et al. '381 to allow erasure and reuse of the recording media to image another object. Further, the photochromic azobenzene materials of Natansohn et al. '381 do not require a development process to be visualized/read.

Alternatively, it would have been obvious to one skilled in the art to modify use the media of Natansohn et al. '381 to record various holograms which are old and well known in the art as being useful for defect analysis or recording images of minute materials using old and well known methods such as those of either of Brooks '012 or Champagne '381

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The applicant argues that the beams do not overlap in the primary references. This contention is entirely without merit as the beams would not interfere and no hologram could result. The formation of holograms requires the overlap of the beams. The reverse is also true, that when overlapping coherent beams of the same frequency/wavelength, interference occurs and holographic images are produced in photosensitive media. In the case of photochromic materials, such as azobenzenes or azobenzene moieties, only the selective absorption due to orientation relative to the polarization of the beams causes a cis-trans isomerization which changes the space occupied by the molecule and gives rise to relief structures in the surface. In the case of holograms, these are interference fringes. The instant specification mentions holograms and gratings in the specification in section [0003] and interference fringes in section [0032]. The rejection stands.

4. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over either of Brooks '012 or Champagne '381, combined with Natansohn et al. '381, further in view of Bieringer et al. '846, Eich et al. '859 and Savant et al. '221.

Bieringer et al. '846 teach various polymeric materials with azomoieties bonded thereto and recording information in them. These are disclosed as having MW of 5,000 to 2,000,000 in lines 34-37 of column 8.

Eich et al. '859 teach various polymeric materials with azomoieties bonded thereto and recording information in them. These are disclosed as having MW of 10,100-47,800 in the table in column 11.

Savant et al. '221 teach various polymeric materials with azomoieties bonded thereto and recording information in them. These include polymers of various MW

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including as low as 4,000. The entry for PMMA and other acrylate polymers specifically includes low, medium and high MW polymers.

It would have been obvious to one of ordinary skill in the art to modify the invention of either of Brooks '012 or Champagne '381, combined with Natansohn et al. '381 by using azobenzene containing polymers with MW of 4,000 to 47,8000 with a reasonable expectation of achieving a recorded image based upon the disclosures of Natansohn et al. '381, Bieringer et al. '846, Eich et al. '859 and Savant et al. '221 demonstrating equivalence.

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


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Kawano et al. '890 teaches an invention overlapping that claimed, but differing from that disclosed in that the angle between the beams is different and an SLM is used in the object beam.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranndt whose telephone number is 703-308-4397. The examiner can normally be reached on Mondays-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Martin J Angebranndt
Primary Examiner
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December 31, 2002